

Loss monitoring systems

A loss monitoring system must be able to compare the amount of fuel that *should* be in an underground storage tank (UST) against the amount of fuel that is *actually* in it.

Why have a loss monitoring system?

Regular monitoring for unexpected losses of fuel (or gains of water) in underground tanks and pipes will help detect any leaks as early as possible. This can potentially save money in lost stock, clean up bills, reduce legal liabilities, protect property values and the local environment.

What is loss monitoring?

A loss monitoring system is a calculation or reconciliation based on three data inputs;

1. the amount of fuel delivered
2. the amount of fuel sold
3. the amount of fuel remaining in stock

Types of loss monitoring

1. Automated Inventory Reconciliation

Sensor probes provide automated tank gauging (ATG) which constantly measures the amount of petrol in each tank. This information is combined with fuel delivery and sales data and reconciled through statistical data analysis.

If certified as capable of meeting the performance criteria for detecting losses of fuel from the UST down to 0.76 litres per hour with at least 95%

accuracy, automated inventory reconciliation is the EPA's preferred loss monitoring method.



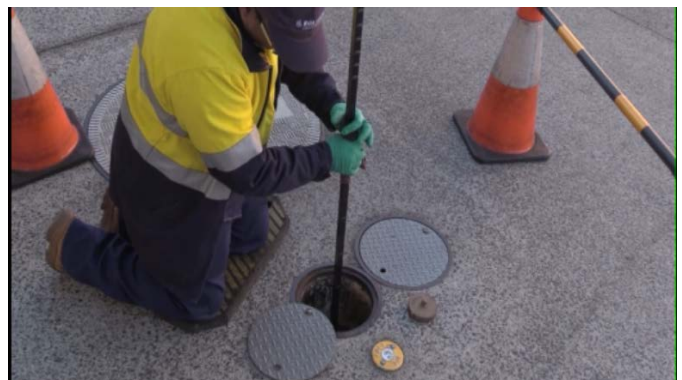
Automatic tank gauge (ATG)

2. Manual wet stock reconciliation

Basic loss monitoring involves manually dipping tanks to measure fuel levels and calculating whether fuel is lost, or water gained, after accounting for fuel sales and deliveries. Tank levels are typically measured daily by manually dipping each tank using a dip stick.

This process is less accurate than automated systems due to variables such as dip stick calibration and thermal expansion of fuel.

Manual wet stock reconciliation is acceptable if the operator can demonstrate the process can detect any loss from the system at or above 0.76 litres per hour with at least a 95% accuracy.



Manual tank dipping

3. Statistical Inventory Analysis

Statistical Inventory Analysis is a best practice method of loss monitoring using computer software to conduct ongoing statistical analysis of fuel inventory, delivery and dispensing data.

It is commonly referred to as Statistical Inventory Reconciliation Analysis (SIRA) and is provided as

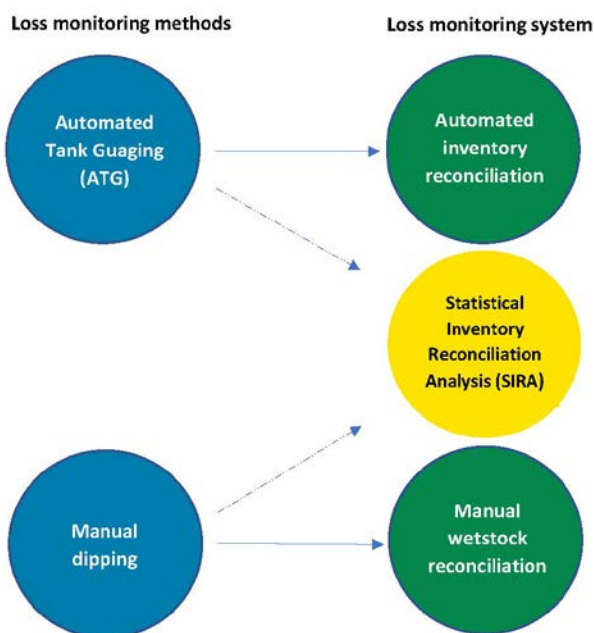
a service to UPSS operators by specialist third party providers. A monthly report flags data inconsistencies. Possible leaks in the system are flagged immediately.

3. Other loss monitoring methods

Interstitial monitoring detects any change in liquid or pressure in the space between double-skinned tanks and piping systems.

It is only suitable as a back-up loss monitoring system for a UPSS.

Equipment Integrity Testing (EIT) measures the containment integrity of the UST, fittings and lines by applying a pressure or vacuum to them and measuring any pressure changes. EIT is likely to be cost prohibitive when carried out frequently enough to be a practical loss monitoring system.



What the law requires regarding a loss monitoring system

Your UPSS cannot be used unless loss monitoring is in place.

The loss monitoring system must be designed by a duly qualified person and comply with section 4.5 of the *Australian Standard – the design, installation and operation of underground petroleum storage systems (AS4897-2008)* and clause 18 (4) of the Protection of the Environment Operations (Underground Petroleum Storage System) Regulation.

It must be able to measure discrepancies between the amount of petrol that **should** be in the system and the **actual** amount of fuel present.

Details of your loss monitoring system must also be included in your Fuel System Operation Plan.

What to do if a loss (or gain) of fuel is detected?

Discrepancies identified by the loss monitoring system can indicate a potential loss of fuel from the system or an influx of groundwater.

It does not necessarily mean that the UPSS is leaking. A 'fail' or 'inconclusive' result could be from mis-calibrated dispensers, inaccurately metered deliveries, human error in recording or stolen product.

If your loss monitoring system detects a discrepancy in your fuel levels or you receive a fail notification from SIRA, you must investigate all possible reasons and record this outcome in your Fuel System Operation Plan.

If a leak is confirmed, you must identify the source of the leak, stop it, and fix it.

General enquiries

Your local council. To establish which council your site is in visit: [My local council | Office of Local Government](#)

To report an incident - Environment Line: phone 131 555 (or from outside NSW phone 02 9995 5555)

Email: UPSSREG@environment.nsw.gov.au

For information on underground petroleum storage systems (UPSS) Visit

<https://www.epa.nsw.gov.au/your-environment/contaminated-land/upss>

Photos

Automatic tank gauge; Photo: EPA supplied
Manual tank dipping; Photo: EPA supplied

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